



Method, apparatus and program to digitise cash into any currencies for payable transactions through a telephone network system in lieu of banking facilities.

Technical Field

5

This invention advantageously relates to a method, apparatus and program to digitising cash into any currencies for payment and to receive payment through a telephone service. This invention relates generally to telephone services in lieu of banking services such as electronic fund transfer and more particularly to a pre-paid card system having a remote terminal such as a phone and a network of point of sale terminals and host computers with a database for accounts for verification of these cards in prepaid amounts, transaction codes, payment codes, receipts codes and their respective owners.

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These are not banking accounts and hence earned no interest for the owners. The owners can transfer this amount into a real banking account provided the desired bank has an account with this system, which allows effective transfer over.

Otherwise for this purpose, the accounts are simply defined as "accounts in transactions". These accounts have one drawback as it incorporates a "decaying" formula to the amount of stored value. This formula however also includes other factors such as frequency used, cost of funds, as criteria to decide the rate of 'decay'.

To ensure further security, it is still an object of this invention to incorporate the point of sale terminal to include a database as well to verify the authenticity of the card and sent this information to the host computer for similar authenticity check and only then will the host computer sent an authorised flag back to the point of sale terminal. The point of sale terminal will only keep track of the activation of a particular card, the amount, the time of sale and deactivation of a particular card. The point of sale terminal can also accept payment and make payment since it has a direct credit or debit facility linked to its account in the system.

To ensure further security, it is still an object of this invention to incorporate unique payment codes, which are issued only at the time of a purchase by the seller. These codes are sent separately to the user/buyer and to the host computer. Once the host computer receives this codes, it will verify the authenticity of the issuer/seller and wait for the user and in this case the buyer to check into the system with the payment code. An unique set of algorithm is then

> Background of Invention

2

Background Art

The present invention relates to the field of digitising cash into any
5 currencies for payment through a telephone service. Banks already have facilities
such as "Phone Banking" which uses a bank centric network system to do
transactions provided one has an account with the bank and money available or
with a credit/debit card. The main problem is how to deposit money in or to
10 convert cash into electronic cash or to digitise it into the account when there is no
banking facility around. For example, to appreciate Phone Banking, one has to
open an account with a bank first. This is a persistent problem plaguing isolated
areas, which may only have telecommunications facilities but no banks or rather
banks find it most costly to operate a physical branch where it is not profitable
when the main thrust of business being local merchant transactions only.

15 Alternatively, the same situation may be faced by ~~Internet~~ ^{electronic} Commerce if
there is no physical bank to convert real cash into electronic cash for payment.
And since Internet Commerce means dealing with International Businesses, a
need to convert instantly to a foreign currency is paramount as well as the need
for secure technology.

20 The problem with security is one of interest since the essence of the
Internet is the ability to break data into packets and hence able to transfer data by
different links with the object of reaching its destination more important than
managing how and in what sequence these packets are transmitted. This means

data security?

anonymous!
anonymity

privacy?

run to authenticate the seller and if it matches, the user can proceed to make payment using the pre-paid card or from the user's stored account and a receipt number is given. In the preferred embodiment of the invention, the user may pay several bills, and the total for each bill and its associated transactional charges is accumulated. Finally, after each payment, a receipt is generated showing the bills paid, the transactional charges, and the total expense incurred by the user in the payment of these bills.

10 It is also an object of this invention to able to display/run audio advertising material while it is processing a command request. The host computer will store all inputted data and maintain a database for all actions taken during its process and those instructed by the users, for example making a payment to a certain company, recording the transaction and replying back to the user with a receipt
15 number.

In accordance with the preferred embodying this invention, an audit trail for a prepaid card transaction is created by storing serial number of the prepaid card which can be read by an
20 infrared reader and providing a transaction identification tag to link the serial number of the prepaid card at each transaction.

In accordance with another aspect of the invention, the method and apparatus provide for the wire transfer of funds to a transferee over this network. In order to carry out the wire transfer, the

leaving any data travelling on the Internet open to scrutiny or interception. This will not happen if the data is travelling on a single link rather than multiples networks as in the Internet. This invention solves the security issue by carrying the last leg of payment through a telephone network on a one to one basis with the host computer thus avoiding the Internet network completely. While interception is still possible at this stage but effectively discourage since the data here refers to payment codes and not financial data. The interceptor will need further effort to break down the code and even if that is successful, it is a payment code which requires a matching code to execute the payment sequence which is then linked to the actual instrument of payment ie the pre-paid card. As a further discouragement, each pre-paid card is limited in value to \$100 only and hence limit any liability to the same amount. And in contrast with a credit/debit card where one credit cards number is fixed and it is possible for crackers to intercept the transaction and break the code and gain access to ones' credit card number or by a means of computer program to second "guess" the credit card number, this invention provide random but verifiable codes for different payments each time. There is no 'permanent' number as in ones credit card.

*problem with
CC.*

The concept of converting one currency to another is not new, banks, money changers and so on provide this service on a daily basis. When one purchase a pre-paid card in one local currency, one can use it to pay for services denominated in that currency but if it is a company in say Australia, then one need to convert it to Australian Dollars first. While a credit/debit card facility can provide such a service it is often 'settled' at the rate that the provider of the

user enters his own account number and password to the account number of the person who is to receive the wire transfer. Preferably, a receipt code is issued to the user. In the preferred embodiment of the invention, the actual payment for the wire can be seen as a mere book entry between two accounts, that is debiting the user and crediting the recipient's account and once this is completed, the user will be given a process number by the host computer and the host computer will dial the recipient's telephone number to inform the recipient of 'new developments' in his/her account. The later is optional and of course a fee will be charge for this service.

In accordance with a still further embodiment of the invention, the pre-paid cards and apparatus allow the payment of invoices or bills owed by the user. After having been qualified as a user by registering into the system.

Brief Description of the Drawings

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates ~~a telephone network~~ in accordance with the telephone calling card and service of the present invention.

FIG. 2 is a flowchart outlining the process of one embodiment of a telephone calling service in accordance with the present invention.

FIG. 3 is a flowchart illustrating another embodiment of the telephone calling service in accordance with the present invention.

FIG. 4 is a flowchart illustrating another embodiment of the telephone calling service in accordance with the present invention.

FIG. 5 is another flowchart illustrating yet another embodiment of the present invention in which an operator interacts with the caller to implement a calling card service in accordance with the present invention.

FIG. 6 is a flowchart which outlines a method in which the system of the present invention determines whether an answering machine has answered a particular call.

*the circuit design links to a public network
switch up*

service consider the most advantages leaving much guesswork by the user of these facilities. In this invention, the user is prompted to the exact foreign currency exchange rate prevailing at that time of initialising the transaction. The user will know exactly how much the conversion rate is and the final amount at
5 that time rather than when the bill arrives. It is then his prerogative to accept or reject this rate. Such prerogative is absent with the use of a credit/debit card. With volatile exchange rate movements, this can be costly. //

Another shortcoming is that banks are open only for limited hours. A
10 suggestion was to apply Automatic Teller Machine (ATM) machines, which may be available 24 hours each day. Unfortunately, ATM may not be able to convert cash immediately into an account holder's account so that other transactions can be made or to take money order or cheque or a host of services. It is also doubtful if ATM machines can provided some or all of the banking type services
15 now particularly foreign currency exchange which is critical in Internet Commerce.

As mentioned, the spirit of this invention was primarily to find a solution to the problem of banking inactivity in certain communities for various reasons. It is
20 envisaged that this present invention will be used by local residents who do not have a checking or savings account with a local bank (either because there is no local bank at their area or it is too far), and who do not use the ATM machines or

DETAILED DESCRIPTION

5 With reference to the attached drawings, several embodiments of the present invention will now be described in detail.

10 In one example of the invention, a disposable pre-paid card may be purchased from a service provider or any location selling them. The card represents a predetermined value in local Dollars terms on the service network of the pre-paid card provider, which can be used for other sub-service providers under this scheme. Alternatively, the pre-paid card service provider can be the sole seller of services as it may be the case if it is a large company controlling various service sectors. Although such a pre-paid card would be of use to anyone for (as it is generally the case now) telecommunications' services, it would be particularly advantageous for individuals who have problems doing daily transaction where there is no banking facilities or where credit/debit facility by banks are also not available or at considerable cost, particularly when foreign transactions are being sought. In particular, the disabled and/or the elderly may find such a card useful or those living in rural areas but with reasonable access to good communication lines.

20 The card may be obtained directly from the services provider or pre-paid card provider or may be obtained from an intermediary which has purchased the card from the services provider. There is nothing, other than a licensing agreement, here to prevent a single service provider from making its own service exclusively such as a pre-paid card for buying petrol only or any items under its framework. The main theme of this invention is for as many service providers can be grouped under a main umbrella so that it provides greater convenient to the users of these pre-paid cards.

25 To access a telecommunications system in accordance with this invention, a cardholder dials a specific toll free number, such as an 800 number (for example, 1-800-PAYMENT) to communicate with the host computer's telephone system. The system will prompt the cardholder in the user's preferred language to enter or speak a personal identification code, such as the user's telephone number and password, so that the card/caller may be verified. Once it is accepted, it will prompted the user to decide on the choices such as 1) making a payment or 2) making a transfer or 3) making a deposit or 4) Account Balance Inquiry 5) Convert Currency 6) Live Operator

30 Say in the case of making a payment, the user is prompt for the services that he/she wish to make payment to 1) Water 2) Electricity 3) Gas 4) Others. Say in this case, the user needs to make a payment to Uncle Tim's Grocery Store so the user will press 4 and the host computer will response with " If you know the Payment Code please press them followed by a Hex # and if you make a mistake press *". After that is done, the computer will authenticate the code and respond with " the amount to pay is \$40 "

35 The computer will check the balance of the user's account. Say in this case, the account holder does not have sufficient balance to pay. The computer will ask whether the user wish to put a deposit.

40 Say the user wishes to deposit. The computer will ask for the Pin number of the card and the serial number or whatever security features that is built into the pre-paid card at that time. The computer will try to verify the pre-paid card and response with "accepted " if it can find a prior activation code assign to this card at the time of purchase.

45 The computer will then asked a series of question to determine 'decay' rate of amount store. For example, how long the user wish to maintain the money in the account, the computer will try to ascertain whether the user is a frequent user, or whether the user is interested in having the

have an ATM card but nevertheless need to pay some bills but have access at least to a public telephone or a mobile phone. ✓

Objective - more when?

Another banking function that is performed from one bank to another bank is a "wire transfer" of funds, which is not generally available to the general public. Rather than going to a bank to wire transfer money, most individuals, as opposed to businesses, commonly wire money through other companies such as Western Union or through the American Express Company. Wire transfer costs are relatively high. There is an average cost of between \$13.00 to send a minimum of \$200.00 by wire and about \$200.00 to send \$5,000.00 by wire. There are many instances when people are travelling or when they have a child at college where it would be desirable to be able to transfer money by wire to their child's account so that the child may have immediate access to the money. Under the present invention and using a pre-paid card, at the cost of a local phone call plus a small fee, such a "wire transfer" service would provide a relatively inexpensive method of wire transfer for individuals to individuals or from individuals to corporations as it was formally designed to perform.

Revenue for this invention can be generated by charging a fee collected when customers pay bills for utilities, such as telephone, electric, gas, and water, as well as other bills, such as cable, television or credit card bills. Typically, there is a \$0.20 per bill service charge for such a bill paying transaction in this framework. It is noted that "money" in the system is stored in two formats. The first being "floating" that is with the prepaid card and the second is "transaction" that is when money in the prepaid card has been deposited into the user's account or effected for payments. The final stage is when the "money" leaves the payment system through a deactivation process and cashing out. There is a cost to store digital money in the user's account, which reflects the cost of money plus a margin. There is also a cost associated to deactivating the prepaid card or money in the account through cash out. The system describe here operate under contract with the local utilities and companies to provide such a payment service.

currency involved convert to another currency to be used in other transactions etc. A formula will calculate the 'decay-rate' and the final amount responded to the user to receive his consent. Without the user's consent, the amount is not entered into the account. However, it should be noted that should another person pick up the pre-paid card tomorrow by accident, then he can use the amount. This stage is called the "floating" stage while money already posted into the user's account is called the "transaction" stage. There is no 'decay' for money in floating stage but it faces risk as real money and that is being stolen.

Say in this case, the user accepts the decay rate and the money is now in the account and full payment can be made. This system also has an unique advertising system and that is every time, the user is waiting for a response from the computer, advertising messages from sponsors will be audible.

Although the present system has been described as a pre-paid calling card system, it should be understood that other forms of payment may also be utilized, such as connecting the calling card to a credit card for payment and/or utilizing the instant card on a collect call basis.

FIG. 1 shows an example of circuit architecture which constitutes an example of the calling card system in accordance with the present invention. The system permits a calling party to make a telephone call to a called number or series of numbers without the need for the caller to have a large supply of currency or a particular credit card--thereby permitting currently available paid phones to be used. The calling party is connected to the called number through one or more nodes in a public switched telephone network (PSTN). FIG. 1 shows an interaction between an end user or calling party 10 with one PSTN node 20. The node 20 may comprise a telecommunications switching system located in a central office. The switching system may be a switching system located in a network provided by a local exchange carrier (LEC) such as one of the regional bell operating companies. The switching system may, for example, be an AT&T 4ESS.RTM. or 5ESS.RTM. switching system. Typically, there are plurality of nodes 20 in a public switched telephone network.

In addition to the network node 20, the architecture of FIG. 1 includes a platform 30 connected to the network node 20. The platform 30 may be co-located with the network node 20 or remotely located with respect to the node 20. The platform effectuates the calling card service of the present invention in conjunction with the usual equipment contained in a public switched telephone network. The platform 30 contains an end office digital switching system 40 connected to the network node 20 via one or more central office trunk facilities collectively designated by reference numerical 35. For example, the switching system 40 may be connected to the central office switching system in node 20 by one or more conventional T1 trunks, ISDN channels, or analog lines, as needed. The switching system 40 performs call processing functions for telephone calls between the platform 30 and the network node 20. The call processing functions of the switching system 40 are controlled by a host computer 60 operating in conjunction with a call record database 70. An automatic dialing unit (ADU) 45 interacts with host computer 60 to automatically dial any recorded telephone numbers. An operator 42 may also interact with the switching system 40. It is to be understood that a back-up switching system, host computer, and call record database may also be used to serve as redundant systems in the event of primary system failure.

The calling card service platform 30 also contains a voice response computer unit (VRU) 50 which performs voice response functions related to account payment. The VRU computer 50 communicates with the caller to assist the caller in reaching the desired functions. In cases where the user is unaware of the Telephone Number of the service provider and as it is difficult to input

This invention is designed for low cost maintenance and applied available technology with the exception of its verifying algorithm in generating purchase code for its customers and matching code for the vendors. It is targeted at low-income society, which has special needs such as safety features, low cost and almost theft proof. For example when the user purchases these pre-paid cards and upon activation, a receipt will be issued to them. This receipt contains the details of the prepaid card such as the serial number, value and time but not the security features, which are stored on the card directly under some scratch-off material. If these pre-paid cards are stolen then they can be traced quite easily using the above records and even if the owner loses it, the owner can return to the vendor where he purchase these pre-paid cards to check the records and obtain the data. The rightful owner can deactivate these pre-paid cards through a request to the host computer since the serial number of the pre-paid card, value and time of purchase are required. And because each card has a trial code, even if these cards have been 'use' that is for some purchase but before receiving the actual service, such payment will be void. Furthermore, if the thief try to use the pre-paid cards through the network of telephones, the host computer will know from which phone the call was made and inform the authorities. If the thief try to deposit the money stored in the pre-paid card into his own account, then his identity will be known as all pre-paid cards have a unique tracking number and all accounts in the host computer are linked to the identity of their owners. If the thief tries to deposit into another person's account the amount once detected will be void. There is nothing to prevent the thief from selling the pre-paid cards in the black market but if the stored value is excluded (by the deactivation process above), then the value of such pre-paid card is no more than the plastic it is made from. In short, it makes this system safer than real money since no one can steal it or counterfeit. The program is designed as a double entry system where it must receive real money for it to issue a pre-paid card and vice-versa to close an entry. These systems is not intended to replace the banking system but serves to supplement certain banking services where bank no longer provides or regard it as unprofitable. Quite the contrary, banks in this instance can be the

the alphabet of the service provider's name, voice recognition technology will be employed. As this technology is still being developed, we are hopeful eventually, this technology will replace the VRU completely. The VRU computer 50 is connected to the switching system 40 through appropriate communication lines.

The architecture of FIG. 1 also contains a service management computer 80 which manages a card database 85 containing relevant information about each outstanding card such as the current balance for each card, as well as a series of pre-selected telephone numbers associated with each personal identification number and calling card. In addition to managing the card database 85, the service management computer 80 also performs operations, administration, and maintenance (OA&M) operations for the platform 30. The service management computer 80 also provides a gateway for remote access to the pre-paid services platform 30. For example, there may be a customer support center 90 which is capable of reading the information contained in the platform 30 and a provisioning system 100 which is able to read-in information already in the platform, as well as write other information into the platform, such as updates to the information stored in the card database 85 (pre-set telephone numbers, etc.) and entry of new software into the platform 30.

It is to be understood that redundant systems may also be used to back-up each of the aforementioned elements of FIG. 1.

With reference to FIG. 2, the following description of a call flow represents the caller's interaction with the pre-paid services platform 30. At step 200, the caller enters a network access telephone number, such as 1-800-CALL-ATT. The system prompts the caller to enter some form of personal identification code or number at step 210. The personal identification code may take the form of the user's name, or the user's name followed by some number to account for a plurality of individuals having the same name. If the system recognizes the personal identification number at step 215, the system proceeds at step 220 to retrieve a series of pre-set telephone numbers associated with that caller from its database 85. The network then initiates dialing a first pre-set telephone number at step 225. At this juncture, N, the number of calls made by the system, is set to one. If a party answers the call at step 230, the system proceeds to identify that a call has been connected, such as by saying "Mom's office" at step 235, so that the caller understands with whom the call has been connected. The system proceeds to determine whether an answering machine has in fact responded (in lieu of an individual) at step 240. If an answering machine has responded, the system allows the caller to either leave a message or have the system dial the next number at steps 245 and 250. If the caller desires to leave a message via step 250 either by pressing an appropriate code on the dial pad or by uttering the appropriate code, the caller may leave a message at step 255 and then the system will proceed to dial the next pre-set number at step 275. If the caller however desires to have the system dial the next number at step 250 (without leaving a message), the caller may input or say a code such as "***X" so that the network proceeds to dial the next pre-set telephone number at step 275. If an answering machine had not responded at step 240, the parties are connected at step 260. The system will continue to dial pre-set telephone numbers at step 275, 280 and 285 until a party answers at step 280. If no party answers, the system via step 275 continues to dial pre-set telephone numbers until the number of calls made (N) surpasses some default level. Should the number of calls surpass this default level, an operator may intervene at step 290 so that, if an emergency situation exists, the operator may proceed to call the police, or other emergency service. As such, the present invention, although not intended to replace 911 services, may be particularly useful in urgent situations.

In an emergency, if the connected party wishes to know the location of the caller, such as a parent wishing to know where their child is calling from, a code such as "**LOC" may be entered and the system will respond with a location identifier to indicate the origin of the call at step 270. The system could also prompt the called party to request information regarding the location of

larger single customer as part of this system since they will be making payment and receiving wire-transfer to and from this system. For this to be accommodated, back-end integration with both sets of computers is required.

5 In the operation of the prior art system, pre-paid telephone cards services are already well accepted in the community for making efficient telephone calls. The reason for this was mainly because of convenience, zero-administration and lower access fees. Such cards are typically purchased from vending machines or shop keepers and come in fixed value increments, for example, \$10, \$50. A \$10
10 card provides a customer with a certain number (eg 30) minutes of long distance time from any touch phone telephone to any location in the country or internationally. These cards are batch activated by the card provider in a limited number of predetermined values to make telephone calls. A customer purchases one of these pre-activated cards by paying a fee usually the face value of the card.
15 The card typically included a predetermined identification code and a special password code is obscured by a scratch off material. To use of the card, the customer accesses the service (usually through an 800-number), enters the identification code (typically obtained from the back of the card), dials the destination number and the call begins. Prior to dialling, the system may inform
20 the user of then-current card balance. If during a call the time remaining on the card is about to expire, the customer may be prompted (through a voice over) that only a certain amount of time remains. When the designated time has expired, the call is terminated. The result scenario is that there is no monthly bills, no surcharges, which fits into our original desire to reduce transaction costs by

the caller. This is analogous to the E911 services available in many parts of the United States, in which 911 operators may obtain information about the location of the caller.

As such, the present invention allows individuals, such as children, to locate and talk by phone with a parent or guardian in a simple manner. In an emergency situation, the present invention could also help reach the police, fire department, or an ambulance. A parent may purchase a special h2h4pre-paid card from the telephone network provider, which is then given to the child. Both the 800 number and the personal code (such as the child's name) will be printed on the card. Therefore, if the child is injured, another individual may place the call, even without knowing the specific telephone numbers (such as the child's home number, their parents' office number, etc.) recorded in the system. In addition, because the card can only be utilized to call the numbers recorded in the system, the possibilities of fraudulent use of the card are minimized.

The actual sequence of the pre-set telephone numbers may be created when the card is either purchased by interacting with a voice response unit or with a customer service representative, or through a mail-in card.

An alternative embodiment of the present invention is shown in FIG. 3. Steps 300, 305, 310 and 315 are similar to corresponding steps of the embodiment shown in FIG. 2. However, at step 320, the network simultaneously calls all the pre-set telephone numbers associated with the caller. There are two possibilities for such an arrangement. In the first arrangement, the system connects to the first individual who answers the call. If the first answered call is answered by an answering machine and the individual does not wish to leave a message, the individual could input a code, such as "***X", to cause the network to disconnect the call and the remaining numbers would be dialed. In the alternative, instead of connecting to the first call that is answered, all calls that are answered within a time limit could be bridged together. In such an instance, answering machines may again pose a problem, though the service would still serve its purpose even if an answering machine was connected in the bridge of calls. To alleviate this problem, the system may, at the time the number sequence is designated, provide a voice tag on the number such as "home, 1", "Mom's office, 2", etc. When a call is connected, it would be announced by the system (e.g. "Dad's office, 3"). If it is determined that an answering machine answered the call, it could be then disconnected with the code such as "3**X", with the "3" indicating Dad's office.

Such an arrangement is shown in FIG. 3 where the first arrangement is shown in steps 325-350, while the second arrangement is shown in steps 355-375. In particular, at step 325, the network connects the first answered call and identifies the connected call at step 330. At step 335, the system determines whether an answering machine has answered the call. If an answering machine has not answered the call, the call is connected and the remaining calls are discontinued at step 336. If in fact an answering machine has answered, the caller at step 340 may decide to leave a message, as in step 345, or the system may proceed at step 350 to continue to call the remaining telephone numbers. With respect to the second option, at step 355, the system will connect each call as it is answered. In addition, the system will identify each call as it is connected and bridge all answered calls together at step 360. If it is determined that an answering machine answered any of the calls at step 365, the caller, at step 370, may decide to leave a message as in step 375. Otherwise, the system proceeds to identify each call at step 360 as it is connected, and bridge all answered calls together.

In this system, the call recipient(s) could enter a code and the system will tell the call recipient(s) the address from which the call is originating. Considering the very special nature of the call, privacy considerations should not be an issue.

With reference to FIG. 4, a different approach, perhaps more suitable for emergency situations,

avoiding any intermediaries/administration such as banks. It also serves our requirements for digitising cash since when one purchase a pre-paid card, one actually has exchange real cash for electronic cash or received some electronic credit in a computing system. And finally, there is no need for a bank to be selling these pre-paid cards. However in the present embodiment, the pre-paid cards are being used for making telephone calls only. There are general suggestions to make it available for some other purposes but not within the framework of this invention.

There is thus a need to improve pre-paid card systems so as to answer the problems of Internet Commerce and secondly for people who have no access to a banking facility.

In a preferred embodiment, a pre-paid card system enables customers to access a telephone network and obtain transaction services such as paying for water, gas, gifts or services other than making a phone-call. The system includes eight main functional components: a plurality of pre-paid cards, a host computer, a plurality of point of sale terminals, and a call processor, a programmable database containing unique customer's account numbers/pre-paid cards security tag, a unique formula to calculate the cost of stored value and a currency conversion function with matching interest rates and a security based algorithm to generate payment codes.

Each of the pre-paid cards preferably includes a body portion and several security features such as pin number imbedded under some scratch-off material. There shall be a formal machine readable code shown on the card so that at the

is shown. In this arrangement, a child may call a number such as 1-800-CALL-ATT and at the initial prompt say "operator" or perhaps "kidcall" (and if voice recognition does not work, press "00"). This would connect the call to a live operator. The child would then say their name and town, or some form of personal code. With this information, the operator could pull-up a file with the pre-set sequence of telephone numbers in an attempt to reach a parent or guardian. Again, should no one be reachable, the operator can call the police, fire department, or an ambulance, if necessary. In such an instance, this arrangement and capability may also be pre-paid, perhaps on a subscription basis, and the appropriate number sequence provided. The call origination location information could also be given to the parent. With particular reference to FIG. 4, such a system is shown in which the caller enters an access telephone number at step 400, at an initial prompt the caller requests "operator" or "kidcall" at step 410, and the operator will request the name of the caller or some form of personal identification at step 420. The operator then proceeds to retrieve a database of telephone numbers associated with the caller at step 430 and proceed to dial these phone numbers at step 440. Alternately, if no human response is received at any of the telephone numbers, the operator may call the police or other emergency service at step 450.

Another alternative arrangement is shown in FIG. 5 in which the child may call the 1-800-CALL-ATT, or other access number, and at the prompt say "call home" (or if the voice recognition does not work, the user may press "00") and then be prompted to give their birthday and age, as well as their name. Based on this information, the system will be able to identify the child and begin any of the sequence of call options (simultaneous or sequential) discussed above. With particular reference to FIG. 5, the caller (1) enters the access phone number at step 500, (2) at the prompt the caller says "call home" (or dials "00" if voice recognition fails) at step 510, (3) the system requests the caller's name, birthday and age at step 520, (4) the system then retrieves the telephone numbers associated with the caller at step 530, and (5) the system then proceeds with the procedures outlined in FIGS. 2 and 3.

With reference to FIG. 6, one approach for answering machine identification is shown. In this approach, the network queries the called party to determine whether it is an answering machine, such as by playing a pre-recorded message: "Are you an answering machine?". If there is speech (that could be an answering machine) while the question is being asked, it is very unlikely that such speech would be live human behavior. In addition, if a "no" response is received, it is unlikely that an answering machine has answered the call. With particular reference to FIG. 6, once the call is connected at step 600, the network prompts the question "Are you an answering machine?" at step 610. If the network receives a "no" response at step 620, the network then determines that a person answered the call at step 630. However, if the network does not receive a "no" response, the network continues to analyze whether or not speech was detected during the prompt of "Are you an answering machine?" at step 640. If no speech was received during that prompt, the system determines that a person in fact answered the call at step 630. If however speech was detected during the prompt, the system determines that an answering machine answered the call at step 650.

It should be understood that the specific embodiments disclosed and described above may be readily utilized as a basis for modifying or designing other structures for carrying out the same purposes of the present invention. It should also be realized by those skilled in the art that such equivalent constructions do not depart from the spirit and scope of the invention as is set forth in the appended claims. Accordingly, the aforementioned description of the preferred embodiments is to be deemed as exemplary in nature, and the scope of the present invention is to be defined by the appended claims.

point of sale, it can be read easily by an infra-red reader to capture the identity of the card being sold or accepted. The card is typically formed of plastic or cardboard. The main management and processing of the system is effected by the host computer, which is connected to the telephone network. The host includes a

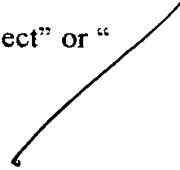
5 database for storing number accounts of individuals or corporations, these accounts private passwords to enter the system, the account balance of these accounts, the security numbers associated with the pre-paid cards at activation time (machine readable by point of sale), the security trials number for transaction after activation, payment codes and receipt codes. The points of sale

10 terminals are remote to the host computer and connectable thereto for transmitting of data between the terminals and the host computer. The call processor is controlled by the host computer for interfacing one of more customers to the telephone network using the authorised pre-paid cards.

Preferably, each point of sale terminal includes means (such as an infra-

15 red reader) for reading a pre-paid card to determine the authenticity of the card for activation. By using a modem to dial and connect to the host computer, this information is sent to the host computer and feedback received the same way. The importance of this security feature means the point of sale terminal may not store activation data prior to activation. The point of sale terminal may store, the

20 card data, time of sale, amount sold and activation data after it has been authenticated and activated by the host computer. The point of sale should preferably has the means such as a display to show receiving data from the host computer. At the minimum, there should be a voice output such as "reject" or "



5 As the case maybe, the calculation of the stored value may be determined by
 multiplying a base price B by those factors. The variables used to calculate the
 stored value from the base be continuously or discretely variable. One set of
 discretely varied variables is described in the table below. There are according to
 this invention many ways of calculating the value and as such these methods are
 10 only for demonstration purposes. In my final product, a combination of a few of
 the methods will be applied. In the final analysis, those most responsive will be
 adopted and refine while those which are not will be abandon.

15 D A factor relating to the number of years before expiry of pre-paid
 card. In this example D decreases as the number of years increases

1 year	1.0
2 years	0.98
3 years	0.95
20 4 years	0.93
5 years	0.90

accept" audible. The system should also include a general accounting and billing information so that system operator can determine which point of sale operator has sold and deactivate a particular pre-paid card. This enables the system operator to reconcile all transactions at the end of the day.

5 The below has outlined some of the more pertinent objects of the present invention. These objects should be construed to be merely illustrative of some of the more prominent features and applications of the invention. Applying the disclosed invention in a different manner or modifying the invention as will be described below can attain many other beneficial results. Accordingly, referring to
10 the following Detailed Description of the preferred embodiment may have other objects and a fuller understanding of the invention.

15 **Objects of Invention**

 The Inventor has developed a method of utilising a telecommunications service system host computer connecting to various point of sale terminal system which is linked to a public telephony system network or through the Internet where applicable. The system consist of computer system with a multi-voice/data
20 communication interface running on Windows NT or Unix or Linux platform with programming using Java, Database SQL or Oracle 8i or DB2, Visual Basic, C plus plus language or any suitable real-time programming language such as QNX.

L A factor related to the value and loyalty of customer that is based on his/her past purchases of pre-paid cards.

	High Demand with purchases over \$1500 a month	1.1
5	Medium with purchase over \$500 a month	1.0
	Low demand with purchase less than \$499 a month	0.97

C A factor relating to the cost of money. (Current interest rate less 100) so if the current local preferred currency's interest rate is 5 percent per annum, then
 10 the value is 0.95 or whatever equivalent to the foreign currency's interest rate if foreign currency is requested which if it is Australia Dollar is also 5 percent.

R A factor related to the flexibility of the customer's purchase plans, that is he/she intends to buy local goods in local currency or might use it for
 15 International purchase such as using another currency.

Flexible (ie wish to purchase goods in any currencies) This factor is the daily exchange rate of a particular selected currency, in this example, we will use the Australia Dollars at 1.42. The host computer will prompt the user to the currency
 20 the user desire.

	Not Flexible (ie wish to purchase goods in local currency only)	1.0
	Otherwise the exchange rate of the desired currency	1.42

Thus according to one embodiment of the invention there is provided,

A call process system comprising:

- 5 Receiving an incoming request from a point of sale terminal through the public telephony System network via a modem or any connecting interface suitable and secured for this purpose,

- 10 Authenticating the pre-paid cards by checking against the serial number and authorising them as "active",

Sent a response back to the terminal point of sale and an special identification code is assigned to the pre-paid card with an initial entry into the accounting record as debit Seller and credit Pre-paid Card No XXXX-XXX-XXXX at the host computer.

15

Authenticating the owners of these cards by checking account (this is usually the residency's telephone number) and password (which can be changed)

Respond with the appropriate welcoming message or advertising messages,

20

Inputting queries and wait for a response

Using these variables, a suitable algorithm for calculating an appropriate option price is as follows:

$$\text{Stored value} = B * D * L * C * R$$

- 5 For example: A one year pre-paid card with face value B of \$100 (US Dollars) will have a stored value of $100 * 1.0 * 1.1 * 0.95 * 1.42 = \148.39 (Australian Dollars) for 12 months.

More sophisticated formula may be used to arrive at a suitable stored value.

- 10 The example above, assume a customer wants to purchase a \$100 pre-paid card.
 15 Further assume that he expects to use it within 1 year from now (D) 1.0, he is an excellent card user (L) of 1.1 (This is determined by the computer by checking his purchase and transaction records stored in its database), Interest rate (C) 0.95 is quoted for Australian Dollars, he wants it to be in Australian Dollars (R) 1.42.

15

- The calculation for payment codes and vendor identification. There are according to this invention many ways of calculating these values. Each vendor is assigned a unique vendor number that is known only to the computer. For example in this case, let us assume the vendor's number is 1234567878907. Now at the vendor's
 20 computer it will generate a payment code to the host computer and to the buyer. The buyer needs to use this code to finalise the purchase. The host computer in this case will add up both numbers generated by the vendor's computer and the answer must be equal to 1234567878907 or in another format $X+Y$ (being the

part to authenticate

Provide advertising messages while it waits for a response from the user or computer,

Prompted the user with the information provided

After inputting and registering the desired information either through the touch-tone method or direct voice method, this will be then sent to the central controller inside the host computer for processing. The sending process is through a telephone line. The central controller will process the information and send a reply/response through the same way back to the user. The above process is repeated again until the user is satisfied with his results.

It is an object of this invention to provide a pre-paid card system to pay both local/foreign services providers and receive funds by providing the method, apparatus and accounting program for transferring cash into numbered accounts and into any currencies through a telephone system in lieu of a banking facility.

It is yet another object of the present invention to provide a prepaid card system where it can perform payments or receivable transactions in any currency by assigning each transaction a purchase code and executing the final payment process over a telephone network.

It is a further object of the invention to provide a pre-paid card system having a plurality of data reading terminals remotely connected to a host computer connected to a telephone network, each of the data terminals providing

unknowns and generated by vendor computer) must be equal to 1234567878907.

In this context, the arguments take the shape of addition with two variables only, there can be many variables or sub-variables in the verification calculation.


Therefore the combinations can be any number but then unique to a specific user

- 5 at any one time. It is also pertinent to note that the vendor's system has no communication link to the host computer other than sending it a payment code. The only security link the vendor's computer has is that it is running a program that generates codes which the host computer can recognise.

- 10 The following is a typical pre-paid card activation to deactivation cycle to pay for a transaction. Assume a customer comes up to a grocery store and request for a \$50 worth of pre-paid card. The clerk then obtains the next card from the plurality of cards and begins the activation process. This is achieved by bringing the card near to a infra-red card reader to identify the machine coding on the
- 15 card. This is read by the reader and send to the host computer for verification (checking against its database) and authentication (flagging "in-use") and finally activated in its database. The host computer will sent an OK signal back to the remote point of sale and displayed " Sell New Card Completed for amount \$50 "
- 20 and the host computer will assign a special number to the point of sale terminal for it to be inputted into its local database. This number will be stored until the deactivation process and act as a "check in" tag in the local point of sale terminal. The customer then pays for the amount and takes the card away. Assume the customer wish to pay for a transaction and there is no banking facilities or credit

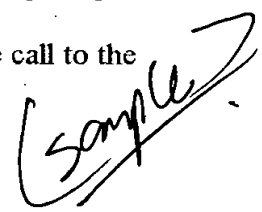
on-site point of sale activation and deactivation in either fixed or varying amount depending on balance of the card or account. The host computer dynamically manages each of the authorised pre-paid cards by assigning them secret codes to their respective users' accounts and interfaces each call to the network.

5 It is still another object of the invention to provide a pre-paid card system wherein each authorised card has a security number associated therewith for enabling a host computer to track usage and for deactivation purposes. While it is possible to incorporate 'recharging' as an option, for the purpose of this particular invention, there is no 'recharging option' for these cards as it weakens
10 the audit trail process.



It is still a further object of this invention to provide a pre-paid card system wherein the host computer maintains a database of authorised cards, the database contains detailed information about where the card was sold, by whom, the amount that was sold, the time of the transaction, transactions made from this
15 amount, updates this balance at the time of a transaction and present the status of each card in the system. The host computer will also maintain a database of
← numbered accounts, which are linked to the pre-paid cards with amounts being credited or debited in the system. These numbered accounts belong to either individuals or corporations and are duly authorised through a prior agreement
20 between the pre-paid cards provider with the individuals or corporations. The core of this invention is the availability of the accounting system which requires double entries to make it possible for transactions such as payment, be made from one individual to another through the system without involving a banking facility.

card. The customer wish to pay to watch some Television program through company XYZ. The customer is not sure how long he will need to watch for. He calls up the company XYZ and ask if they will be able to use this pre-paid card. Assume that this company XYZ is also a customer of this system and therefore
5 able to accept this facility. Assume at this time, company XYZ is manned by a live operator, the operator will merely take down the particulars of the pre-paid card which in this case is the card number, the security number or password and input it into its system. Company XYZ's system will call up the host computer to check for this card to verify its authenticity and amount balance. Since the
10 customer is not sure how long he needs the TV program, the full amount is credited first and when the customer is finished, he can call back to company XYZ to tell them to stop the TV program for him. At that time, XYZ's system will record how long the duration was and charged the customer for the amount. Suppose customer dozed off while watching the TV program, then XYZ's
15 system will stop the program once the amount of \$50 is used up or prompt the customer to pay more when it is almost up by making a telephone call to the customer.



Now suppose, customer wants to pay for his water bill and this time his water
20 company has a direct account with the prepaid Card Company. The customer will call up a special number provided by the pre-paid Card Company. The customer will then first input his own account number and password to authenticate his own account. The host computer through an interactive voice response system